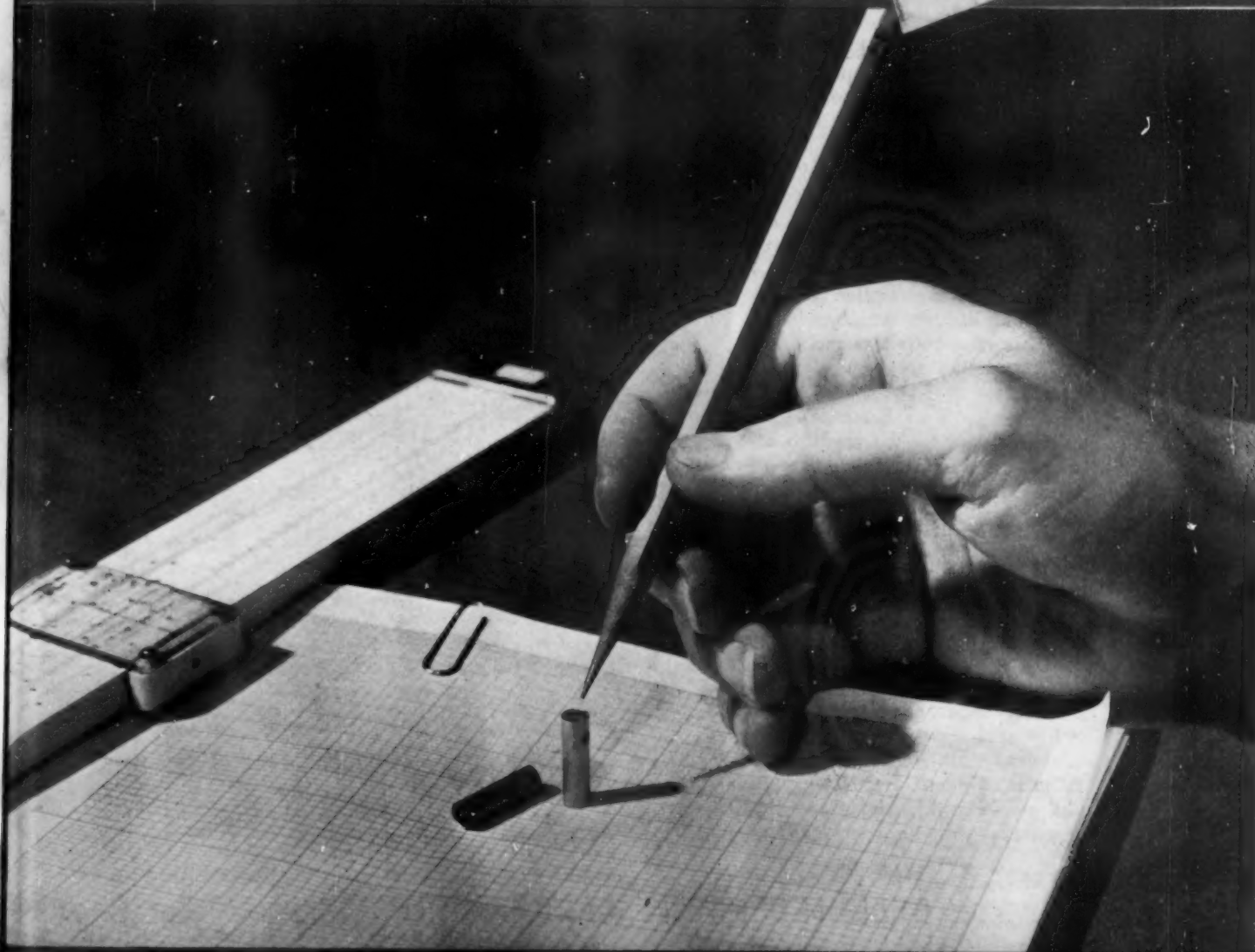


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JULY 10, 1948

# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



New Electronic Amplifier

See Page 19

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VOL. 54 NO. 2

# RUBBER RECIPE

Rubber compounds to the tune of some 35 million pounds a year go into the Bell System plant. Each compound must meet many requirements for resistance to humidity, oxygen, ozone, light and abrasion. The right properties depend on skillful selection and compounding of ingredients; this is one of the jobs of Bell Laboratories.

Sulphur, one essential ingredient of rubber, can also be corrosive. That seemed to rule out rubber on telephone cords. But Bell chemists found that if they held sulphur to the bare minimum, corrosion ceased. Now your handset cord has long life, is less susceptible to moisture as, for example, from a wet umbrella.

Connecting your home to the telephone wire on the street is a "drop"—one hundred feet or more of rubber-insulated wire. Once this wire was protected from ozone, light and abrasion by an impregnated cotton braid; but water leached the impregnant, and the braid rotted. Bell chemists tested scores of synthetics, and selected neoprene as an exterior covering with many times the life of braid.

Rubber is only one of many types of insulation developed by the Laboratories for the Bell System; insulation is only one of the Laboratories' problems in providing a quick, economical path for your voice.



## BELL TELEPHONE LABORATORIES

EXPLORING AND INVENTING, DEVISING AND PERFECTING FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE.



## ELECTRONICS

# Vacuum Tube Has Rival

New transistor, made of semi-conducting germanium metal, may result in more stable and durable radios, television sets and electronic devices.

## See Front Cover

► THE glass vacuum tube in your radio has its first rival in 40 years—a bit of semi-conducting germanium metal that amplifies or oscillates current without the complexity of plates and wires in an airless bulb.

This new transistor, as it has been christened, should allow more stable and durable radios, television sets and electronic devices. Radios may be made smaller, when the new cylinder, slimmer than a pencil and less than an inch long, as shown on the cover of this week's SCIENCE NEWS LETTER, comes out of the development laboratories into production.

Because the new device has no filament that must heat up before it operates, it goes into action instantly. It will do some electronic tricks that conventional vacuum tubes can't do. This means new electronic devices.

Invented at Bell Telephone Laboratories in New York, the transistor's operation is possible because the ability of a semi-conductor to carry electrical current can be controlled. This is done by changing the

electronic structure of a small bit of material under the influence of the incoming current, fed to it through a fine "cat's whisker" wire. The current coming out of the other wire, just about two thousandths of an inch away, is boosted in volume a hundred fold.

Dr. John Bardeen and Dr. Walter H. Brattain made the key investigations in the Bell Telephone Laboratories that produced the transistor, while the program was initiated and directed by Dr. William Shockley.

Since electrical speech waves traveling between telephones can be amplified, the transistor will probably replace the vacuum repeater tubes now used on long distance and other telephone lines.

A superheterodyne radio set with about a dozen transistors instead of conventional tubes has been demonstrated and probably is the forerunner of a new family of radios.

Because it can oscillate as well as amplify, the transistor will be used to produce standard frequency tones and for other similar uses.

Germanium metal specially treated is the

semi-conducting material used, but other semi-conductors include silicon, some metallic oxides and other compounds. Semi-conductors have electrical properties intermediate between those of the metals and insulators.

Semi-conductors, copper oxide and selenium have been used previously to rectify alternating to direct current, and silicon has been used as a detector, particularly for microwave radio apparatus.

The transistor as now developed has a frequency limitation of about 10,000,000 cycles per second, but it is quite satisfactory in the television ranges.

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## PUBLIC HEALTH

## Later Years Are Rated Special Concern of Women

► BECAUSE the average woman is destined to outlive the average man, the middle and later years are of special concern to women, says Dr. Clive McCay, professor of nutrition at Cornell University. "Furthermore," he says, "wives are usually younger than husbands, and like it or not, the average wife must face five to eight years of widowhood."

All of which means that older women must face the future realistically. "The best insurance for health during the late years is to cultivate good food habits throughout life."

Fixed food habits centered on poor diets such as living on tea and crackers insure poor health and disaster during the late years, he warns.

Pointing out that many more women than men are in homes for the aged, Dr. McCay says the time would seem ripe for women's organizations to demonstrate what they can do in solving problems for the aged. These problems involve economics, sociology, housing, employment, recreation, psychology, medical care and numerous other fields.

"These problems are solvable," says the Cornell scientist, "but few of us face them until our minds and bodies are too far exhausted."

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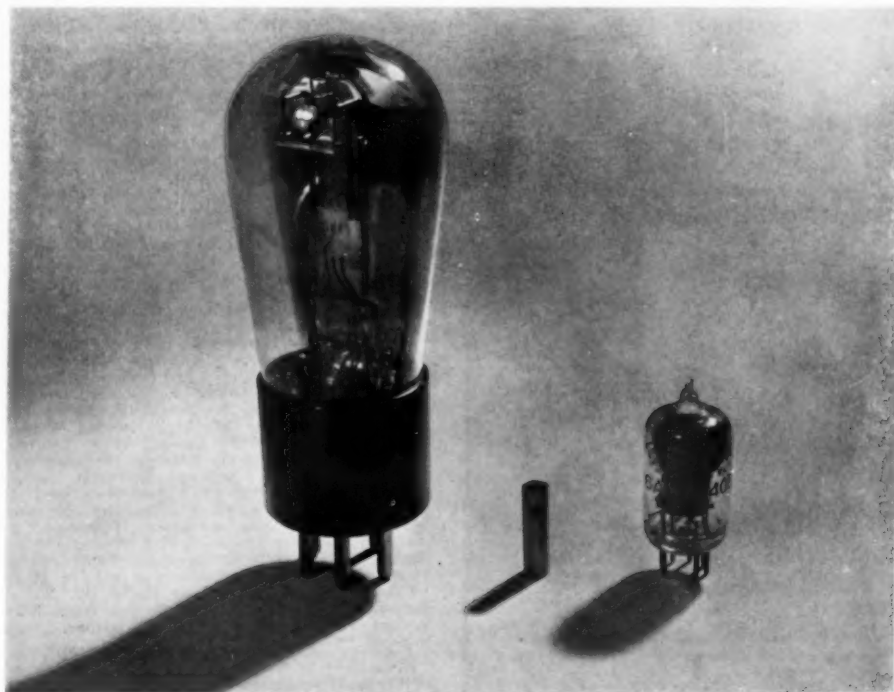
## ASTRONOMY

## Nova Formed by Big Shell Blown Off Star's Surface

► A NOVA or "new star" appears in the sky when a star literally "blows its top."

A star flares into a nova when a huge shell of very bright material is blown off its surface, Dr. Dean B. McLaughlin of the University of Michigan reported to the joint meeting in Pasadena, Calif., of the American Astronomical Society and the Astronomical Society of the Pacific.

The outburst, in which the star's apparent brightness may increase 10,000 times in 24 hours, is probably only a single eruption



**TRANSISTOR**—Overshadowed by two bulky vacuum tubes on either side, it may replace them in many electronic devices that will benefit from its small size, absence of glass envelope, plates and wires.



of energy, not a series or train of explosions, Dr. McLaughlin stated.

The spectra of two bright novae were carefully examined by Dr. McLaughlin. One of these exploding stars was found in the constellation of Perseus in 1901, the other in the constellation of Gemini, the twins, in 1912. Both stars remained bright only a short time and have since subsided to relative insignificance, the usual procedure for novae.

Light from a shell of gas approaching the earth at the rate of about 400 miles a

second was the most prominent feature of the spectrum of Nova Persei. It was present within a day after the star's maximum brightness and still prominent 18 months later. Many years later a nebula with exactly this same velocity was visible, expanding around the star.

There is some evidence of more than one outburst for Nova Geminorum. But all the prominent structural features of the expanding shell were present within four days after the star's maximum light had been reached.

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stars themselves, he stated. Once again observations with the war-developed photoelectric photometer promise to outmode those made by earlier methods.

Stars in the famous cluster known as Berenices Hair and the Hyades, in the constellation of Taurus, the bull, were studied because in a cluster sufficiently far away from us we can assume that all the stars are at about the same distance. Thus distance is eliminated as a factor influencing the star's apparent brightness.

All stars brighter than photographic magnitude ten in the Coma cluster were observed during this study. Only some 50 of the 150 stars in the Hyades cluster were examined, the observing season being one of the poorest in years for Madison, Wis.

Science News Letter, July 10, 1948

#### ASTRONOMY

## Hydrogen Gas Robs Star

► HOT clouds of hydrogen gas in an active state may rob a star's spectrum of the visible evidence that ample quantities of such elements as calcium, zirconium and magnesium exist in the star.

This theory was proposed by Dr. Jesse L. Greenstein of the Yerkes and McDonald Observatories of the Universities of Chicago and Texas before the joint meeting of the American Astronomical Society and the Astronomical Society of the Pacific in Pasadena, Calif.

Most of the stars are much alike in the kinds and amounts of elements of which they are composed. But there are many exceptions. A certain peculiar star, about as hot as our sun, for example, appears to have only about 10% as much calcium, scandium, zirconium, magnesium, titanium and vanadium as does the sun. Other elements, however, are present in normal amounts, Dr. Greenstein found by analyzing spectra taken with McDonald's 82-inch reflecting telescope.

The apparent deficiency of these elements may be only a delusion, Dr. Greenstein reasons. Ionized hydrogen may rob the spectra of the very lines by which astronomers are accustomed to identify these elements.

From below the visible surfaces of stars such as the peculiar one studied by Dr. Greenstein may escape hot clouds of hydrogen gas, itself in an ionized state. This hydrogen, each atom of which lacks its single attendant electron, is greedy for electrons to such an extent that it may rob the nearest atoms of these elements.

The outward flow of some hotter ionized material from the interior of a star may thus upset the star's spectrum.

### Brightness of Stars

The all-important relation between a star's brightness and its temperature may be simplified because of observations made by Olin J. Eggen of Washburn Observatory, University of Wisconsin.

Blue stars are known to be hot; yellow and red ones are relatively cool. A normal star of the same color and temperature as the sun probably has the same intrinsic brightness, Mr. Eggen reported at the astronomers' meeting.

In the past some stars of the same color and temperature as our sun have been considered brighter, some fainter. This is due largely to previous errors in measurement rather than to any complex nature of the

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What new benefits have been derived from benadryl, the anti-allergy drug? p. 21

Photographs: Cover, p. 19, Bell Telephone Laboratories; p. 21, The Glenn L. Martin Co.; p. 23, Boeing Airplane Co.; p. 26, p. 27, American National Red Cross.

## MEDICINE

# Treat Death-Causing Ills

**Patients with diseases which are a leading cause of death in the nation will receive treatment at the new clinical center in Maryland when it is erected.**

► IF THREE YEARS or so from now you have a baffling kind of heart disease, cancer or mental illness for which no cure has meanwhile been discovered, you may find yourself on the way to Bethesda, Md., suburb of the nation's capital, for study and treatment.

Because in about three years the U. S. Public Health Service expects to have completed here its 13-story brick hospital and research laboratory building, to be known as the clinical center of the National Institutes of Health.

The 500 patients of the hospital will be a select group. Select because they have an illness which is a leading cause of death or disability or both in the nation at that time. Right now, heart disease, cancer, mental illness and some tropical diseases are the ones slated for study. But, as Dr. Leonard A. Scheele, Surgeon General of the U. S. Public Health Service, put it in announcing plans for the clinical center:

"If anyone cracks the cancer problem before the center is completed, we won't take any cancer patients. We will devote our efforts to some other unsolved disease problem of public health importance."

The building, as now planned, will house the National Institute of Mental Health and hospital facilities of the National Cancer Institute, the National Heart Institute and the National Institute of Dental Research. The hospital part of the building will be its smallest part, since the object of the center is research leading to improved treatment.

Patients while under study, however, will have the highest quality of medical care with the most modern facilities. They will come from all parts of the country, when referred by their doctors, hospitals and other health agencies on the basis of problems under study at the center at the time.

Whether patients who are able to pay will do so, perhaps through contributions to one of the National Institutes, or whether all care and treatment will be free has not yet been determined.

An efficient, smoothly performing professional staff will be ready as soon as the building is completed. "Colonies" of physicians and other medical researchers are already working together at Public Health Service and other institutions throughout the country, readying themselves and their skills for work at the center when it opens. In addition to the physicians and researchers, a staff of some 1,500 nurses, dietitians, orderlies and kitchen workers is planned.

Housing accommodations for patients' relatives and for patients returning for follow-up study a year after treatment are

included in present plans. An apartment hotel on the center's grounds will be built for them, if housing facilities in Washington are still overtaxed three years from now.

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## MEDICINE

## Anti-Allergy Drug Aids Shaking Palsy Patients

► BENADRYL, medicine which has brought relief to many a sufferer from hay fever and hives, now is helping patients with shaking palsy, known medically as paralysis agitans or Parkinson's disease.

Its successful use in ten patients is reported by Dr. Joseph Budnitz of Pittsfield, Mass., in the *New England Journal of Medicine* (June 17).

The drug is not reported as a cure for the condition, and Dr. Budnitz points out that the "good results obtained in this small

group may not withstand the test of larger series of cases."

All the patients, however, "noted considerable improvement in symptoms" as long as they continued to take the drug.

A 68-year-old man, sick for four years, with such palsied, trembling muscles that he could not feed or dress himself and had to be helped out of a chair is now, three months after starting benadryl, leading a normal business and social life. Within seven days after starting the treatment, he was able to get out of a chair alone, dress himself and use a knife and fork and could sit for one hour without tremor.

Patients who previously could only take a few shuffling steps were able to walk farther and lost the shuffling gait. Those who had been kept awake by muscle cramps at night found themselves able to sleep all night.

Four of the ten patients had to go on taking drugs like atropine or belladonna with the benadryl. The benadryl and the atropine seemed to reinforce each other's effect on the patient's symptoms.

Dr. Budnitz suggests that benadryl's effect may be due to its atropine-like action, or it may be due to enhancement of circulation of the part of the brain where the symptoms of paralysis agitans are initiated. A closely related drug, pyribenzamine, also used in hay fever, did not help the paralysis agitans patients.

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**DIRECT READING GAUGE**—Designed for use with the Martin 2-0-2's fast new under-wing fueling system, this gauge pulls down from inside the rubber fuel cell. A small ball, punctured with holes, on top of the gauge permits the fuel to trickle through the cylinder and drip out when the gauge reaches the level of gas in the cell. By reading the level at which it begins to drip, the mechanic can determine the fuel content.



## BACTERIOLOGY

## New Germ-Fighting Tactics

Bacteria are "smothered" to death with weed-destroying 2,4-D and viruses are subjected to the shattering vibrations of intense sound.

► "SMOTHERING" bacteria to death with 2,4-D, popular war-born weed-killer, and shattering viruses with intense sound waves are the latest steps in man's war against germs as reported by two groups of investigators in the journal, *Science* (July 2).

No immediate practical application is suggested in either report. But the work adds to knowledge which may lead to better methods for fighting disease germs.

The way 2,4-D, which is really a plant hormone or growth regulator, kills some kinds of plants is not definitely known. It has been thought to interfere in some way with plant respiration, or breathing. Bacteria which require free oxygen for their breathing are "smothered" by 2,4-D, report Drs. Winfield A. Worth, Jr., and Anne M. McCabe of Duke University School of Medicine. They react similarly to germinating barley seeds, which are stopped by the chemical. But bacteria that cannot live

with free oxygen, including such deadly ones as the germs of tetanus, gas gangrene and botulism, are not affected to any significant degree by 2,4-D.

Viruses that prey on bacteria, such as the bacteriophages, were subjected to the shattering vibrations of intense sound. Electron microscope studies showed that the ones that were resistant to the intense sound waves were all small sphere-shaped viruses. The ones disintegrated by the vibrations were relatively larger, tadpole-shaped viruses with more complex structure and frequently with pointed heads. These studies were made by Drs. Thomas F. Anderson, Shiela Boggs and Betty C. Winters of the University of Pennsylvania under a contract with the Navy and supported partly by a grant from the Raytheon Manufacturing Company whose magnetostriction sonic oscillator was used.

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## GENETICS

## Corn May Fight Pellagra

► PELLAGRA, hard-times disease among cornmeal-eating peoples, may some day be combatted with the very grain that is now blamed as its chief cause. Possibility of producing strains of hybrid corn with high content of niacin, the pellagra-preventing vitamin, is pointed out in *Plant Physiology* (April) by Dr. Frederick D. Richey of the U. S. Department of Agriculture, who works at the Tennessee Agricultural Experiment Station in Knoxville, and Dr. Ray F. Dawson of Columbia University.

A preliminary survey showed that the niacin content of different existing strains of corn is highly variable. Dr. Richey's own breeding experiments confirmed this, with niacin content in different lines ranging from less than 14 parts per million by weight to one exceptional inbred line that ran somewhat better than 53 parts per million. He was able to build up one hybrid that consistently had a niacin content well over 40 parts per million.

Drs. Richey and Dawson conclude that corn hybrids with niacin concentrations as

high as 50 parts per million can be developed.

That does not necessarily mean, however, that such hybrids are going to be developed, because other factors have to be taken into account. Such readily recognizable qualities as high yield per acre, sturdiness of stalk, and resistance to drought, diseases and pests are not likely to be sacrificed for the sake of an invisible improvement in the vitamin content of the grain. Individual farmers have individual preferences, which do not always have much to do with the intrinsic value of what they plant. And since different parts of the country have marked climatic and soil differences, the difficult job of producing a high-niacin hybrid would have to be done not once but several times.

Dr. Richey, a pioneer leader in the cooperative research program that gave hybrid corn to American agriculture, was recently given the U. S. Department of Agriculture's Distinguished Service Award.

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## BOTANY

## Irradiated Seed Deforms

► ATOM-BOMB RAYS powerful enough to kill men or animals, released at the first Bikini burst, failed to kill grains of seed-corn exposed on the decks of the target

ships, but did cause them to produce plants with many defects and abnormalities. First results of these experiments are described in detail in *Science* (July 2), just two years

and one day after the burst, by Drs. L. F. Randolph, A. E. Longley and Ching Hsiung Li, Cornell University botanists.

Two kinds of seedcorn were used in the tests, one a single-cross hybrid field corn, the other an inbred sweetcorn strain. Twenty-five packages, each containing from 1,500 to 2,500 grains, were exposed on ships in the target array, at varying distances from the center of burst. Similar lots were exposed to graded X-ray doses, from 5,000 to 25,000 Roentgen units. Finally, samples of both kinds of seed were kept untreated, for planting as controls.

As soon as the irradiated seed had been returned from Bikini, portions were planted at the U. S. Department of Agriculture experiment station at Beltsville, Md. Other plantings were made at the experimental farm of the California Institute of Technology, with all three groups of seeds included.

The untreated control seed produced plants of the uniform types expected of corn bred by modern methods. Both the Bikini seed and the X-rayed seed produced many abnormal plants. Some of these had twisted, crinkled, diminutive or otherwise deformed leaves. Other leaves, normal in size and shape, had areas lacking chlorophyll, the green food-making substance, or else completely dead spaces which often resulted in lengthwise splitting.

Tassels also were aberrant, producing as much as 50% of dead or otherwise abnormal pollen. Microscopic examination disclosed derangements and partial destruction of many of the heredity-controlling chromosomes in the cells.

X-rayed seed exposed to doses of between 10,000 and 15,000 Roentgens produced plants most nearly resembling those that came from the Bikini seed, although the similarities did not amount to identity.

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## AERONAUTICS

## Guggenheim Medal Goes To Aircraft Engineer

► THE prized Daniel Guggenheim Medal, given annually for achievements in aeronautics, has been awarded for 1948 to Leroy R. Grumman of the Grumman Aircraft Engineering Corporation, Plandome, Long Island. As recipient, Mr. Grumman takes a place along with Orville Wright, Glenn L. Martin, Donald W. Douglas, Juan T. Trippe, Lawrence D. Bell and other notables in aviation accomplishments.

The selection of the recipient of this medal each year is made by a board of 21 persons, including those formerly honored, together with representatives of the American Society of Mechanical Engineers, the Society of Automotive Engineers, the Institute of the Aeronautical Sciences and the United Engineering Trustees.

Advanced aircraft design both for Naval and civil use earned Mr. Grumman the medal.

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## ANTHROPOLOGY

# Refill German Science Gap

Two U. S. books on anthropological subjects that would have been burned as heretical by the Nazis have been translated into German.

► TWO AMERICAN books that Hitler would certainly have burned, had he known about them, have been translated into German and will soon be published by the firm of Sebastian Lux, of Murnau, a suburb of Munich. They are both on anthropological subjects, and they contain statements that by Nazi criteria could only have been judged as the rankest heresies.

One of the books is *Apes, Giants and Man* (Chicago University Press), by Dr. Franz Weidenreich, German-born but now an American citizen. Dr. Weidenreich had for years been conducting distinguished research on Peking Man in China, when he found it necessary to get out in a hurry to escape capture and internment by the Japanese invaders. He is now at the American Museum of Natural History in New York.

In his book he says: "As far as head index is concerned, the central European population is not longheaded and not Nordic . . . If the desirable mental qualities are really bound to longheads, and the undesirable ones to roundheads, as has been surmised, the good qualities should be present in only a very small percentage of the central European population. The overwhelming majority would have only bad qualities."

He also presents, side by side, profile pictures of the death mask of that ultra-Nordic, Frederick the Great of Prussia, and of the mummified head of the ancient Egyptian pharaoh, Rameses the Great, a member of the "Hamitic" race. They look enough alike to be at least cousins; the noses are especially similar.

The second book is *Mankind So Far* (Doubleday, Doran), by native-born Prof. William Howells of the University of Wisconsin. Here are some of the things he says, that would surely have made Nazi hair stand on end:

Of blood: "The blood of all men is precisely the same substance, and if you, a white American, were filled to bursting with transfusions of the blood of other races there would still be no chance that your skin would darken (or that of your children), or that you would start to speak Choctaw."

Of Nordics: "The traditional belief, and the one on which the writers on Nordic or 'Aryan' supremacy banked, was that the Nordics arose in a particular place as a unified, unmixed race, endowed by Providence with yellow hair and a knowledge of what is good for other people, and that all of European blondness can be traced back to them. There seems to be little back of the idea in actuality."

Of Jews: "It is not easy to say anything anthropologically sound about them . . . From what I have said already it should be plain that they cannot be of any extraordinary origin, and can only be descended from Mediterraneans of the various Neolithic types."

Herr Lux is also responsible for the publication of a considerable number of books by German authors on a variety of scientific subjects, mostly in small pocket format, and for a monthly popular science magazine titled *Orion*. These publications are designed to refill, as rapidly as possible, the terrible gap left in general scientific education in Germany by the interference of the Nazis.

Appropriately, the chief editor of the firm, Dr. Erich Lasswitz, is a man whom the Nazis persecuted. After a quarter-century as editor of the *Frankfurter Zeitung*, leading liberal daily of pre-Nazi times, he was thrown out of his job by Goebbels, and forced to live in retirement until liberated by American troops in 1945.

The magazine, *Orion*, is his brain-child. With the help of an 18-year-old niece, he worked up material for the first two issues in a kitchen used at the same time by his wife and another woman, because that was the only warm room in the house. Beginning thus away back of scratch, he has in two years brought *Orion's* circulation up to 55,000—and has a waiting list that will double that figure if he can ever get enough paper.

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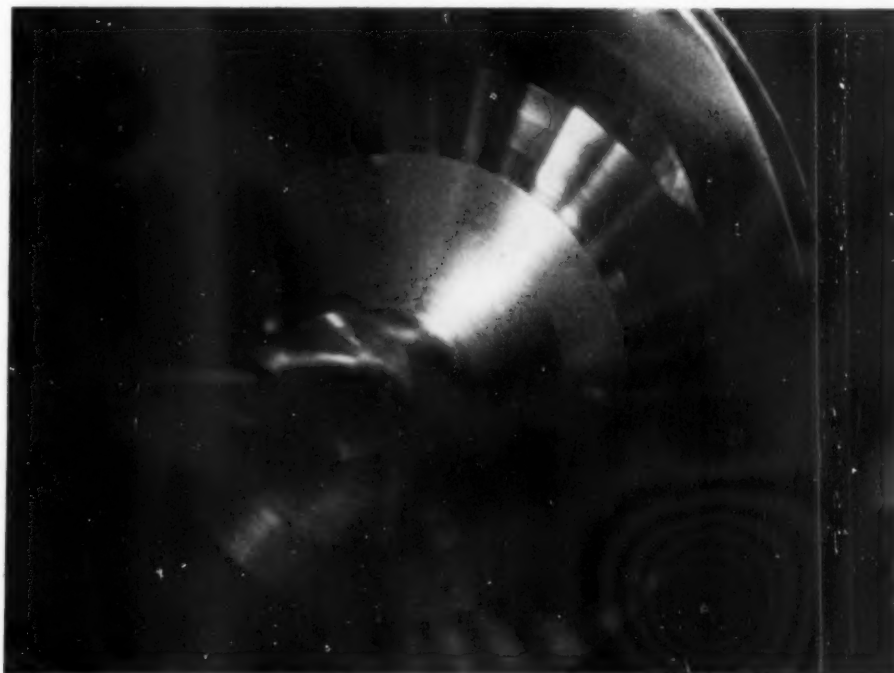
## MEDICINE

## High-Fat Diets Declared Bad for Heart Patients

► WARNING against a high-fat diet for patients with heart disease was sounded by Dr. Milton Plotz of Brooklyn at the meeting in Chicago of the American Medical Association. Deaths of 10 heart patients within seven months after being put on a high-fat diet, and much worse heart symptoms in 12 of another group of 17 within three months after being put on a high-fat diet, were cited by Dr. Plotz.

The high-fat diets had been given most of the patients as part of standard treatment for stomach ulcers. One of them was given the diet to "build him up." Ulcer patients, who have heart disease, Dr. Plotz warned, should be given frequent feedings low in fat.

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**ULTRA-HIGH SPEED STUDY**—This unusual picture shows what happened when a gas turbine engine was spun at 73,285 revolutions per minute. A blade was thrown. It can be seen at the upper right as it crashed into a copper protecting screen and automatically tripped a flash light to take its own photograph in one five-millionths of a second.



## CHEMISTRY

**Rediscover "Lost" Secret Of Stradivarius Varnish**

► THE "lost" secret of the varnish used on Stradivarius, Guarnerius and other famous old Italian violins has been rediscovered and the varnish duplicated by Joseph Michelman of Cincinnati. Chemical and spectrographic analyses of small samples of varnish removed from authentic old violins show many things about its composition.

Recently Mr. Michelman, with the technical assistance of Otto Lang and Everett J. Shaw, has analyzed the red-brown varnish of a Francesco Ruggieri 'cello, made in 1691; he reports briefly on his results in *Science* (June 25).

The 'cello was double-coated, with a yellow under-varnish and a brown-red top coat. The red color was found to be due to madder, a vegetable dye. Spectrographic analysis showed the presence of considerable calcium, with smaller amounts of other metallic elements.

It was known that the type of varnish known as calcium rosinate is brown. When varnish of this kind was mixed with raw linseed oil and applied, the color was lost. However, when the oil was pretreated and the varnish then applied in thin coats and exposed at once to light, the color became permanent.

Mr. Michelman states in conclusion, "A brown-red varnish composed of alizarine-calcium rosinate and linseed oil, with turpentine as the solvent, has been prepared that possesses the desired depth of color, transparency and permanence in its dried and aged films."

*Science News Letter*, July 10, 1948

## GENERAL SCIENCE

**Better Fitting Clothes Part of Standards Study**

► HOW MANY feet of concrete are needed to protect you from extremely high voltage X-rays and how to make children's clothes fit more children better are two problems now being solved by research at the National Bureau of Standards.

Dr. Edward U. Condon, director of the Bureau, described the new studies as guest of Watson Davis, director of Science Service on Adventures in Science, heard over the Columbia network.

A new 50-million volt betatron at the Bureau will be used to set standards for safety from the high voltage rays. Dr. Condon explained that safety standards are required by the use of high voltages in industrial applications of X-rays.

Mothers may have better luck fitting their youngsters with new clothes, thanks to research being conducted at the Bureau in cooperation with the Bureau of Home Economics of the Department of Agriculture which supplied measurements of more

than 100,000 children. The figures have shown what most parents have discovered that age is a poor guide to fitting their children with clothes.

When new, voluntary standards are adopted by industry, better fitting clothes can be expected by parents. Next clothing standards job will be a sizing system for teen-agers.

Other Bureau research reported by Dr. Condon included a standard of length 21-millionths of an inch long and calculating machines which work at nearly the speed of light.

A single wavelength of green light radiated by an atom of mercury with an atomic weight of 198 is being used as a measuring standard. This variety, or isotope, of mercury is produced in atomic piles by bombarding gold with neutrons. For measuring, this light gives scientists an indestructible standard, because all atoms of this form of mercury will always give the same wavelength of light.

With mathematics and statistics forming an important part of fundamental research in modern science, a National Applied Mathematics Laboratory has been established at the Bureau to speed the solving of mathematical problems. New computing machines, Dr. Condon pointed out, will work at speeds measured in millionths of seconds.

*Science News Letter*, July 10, 1948

## ARCHAEOLOGY

**Ancient Indian "Whodunit" Posed by Skeletons**

► THE old but not very elegant lyric that demands to know "Who put the overalls in Mrs. Murphy's chowder?" has a newer counterpart about a still older and grimmer mystery: Who jammed dead Indians in the Delaware clambake pits?

The Smithsonian Institution has just come into possession of several skeletons found in some four-foot-deep pits near Lewes, Del., filled with oyster and clam shells. They were not regular burials, but the distorted positions of the skeletons indicated that the dead men had been forced into holes too small for them.

Dutch settlements came early to this part of the Delaware coast, yet there is no trace of white men's trade-goods with any of the skeletons. The finds are therefore presumably pre-Columbian.

The pits were discovered in the course of plowing some long-uncultivated land. First thing noticed was the unusually large size of the clam and oyster shells, although they belong to the species still found in the region.

Attention of the Smithsonian to the finds was called by the Sussex County Archaeological Association, which turned over all the material. The site has been examined by Dr. T. D. Stewart, Smithsonian curator of physical anthropology.

*Science News Letter*, July 10, 1948

**IN SCIENCE**

## METEOROLOGY

**Daily U. S. Weather Map Gets That "New Look"**

► THE U. S. Weather Bureau's daily weather map has a real "New Look." Three new things have been added:

1. The top line of the main map has been pushed considerably to the north, up to latitude 55 degrees. This will include such Canadian cities as Edmonton and Saskatoon, and the great sweeping spaces of the Prairie Provinces over which so much of our weather comes to us, especially in winter.

2. The small inset map showing the weather of the previous day has been enlarged to show conditions for the entire North American continent, and a considerable stretch of ocean on either side.

3. An entirely new inset map will show, as continuous lines, the altitudes at which an atmospheric pressure of 700 millibars exists. This is normal pressure for 10,000 feet altitude, but the height at which it can be found at any given moment varies, which makes it a matter of considerable importance not only for airmen but for many people on the ground whose business is affected by the weather. The same map will show temperatures, at intervals of 10 degrees Fahrenheit, on the 700-millibar "contours," and also existing weather fronts at the same level.

*Science News Letter*, July 10, 1948

## SEISMOLOGY

**Four Separate Quakes Recorded in Three Days**

► FOUR separate earthquakes in three days were recorded in the last days of June.

The quakes began Sunday, June 27, with shocks south of the Alaska peninsula and under the Gulf of Mexico off the Guatemalan coast. A disastrous shock struck Japan June 28 and the region of the Samoan Islands was shaken the following day.

Scientists say that there is no evidence that such widely separated quakes are related in any way.

Although thousands of persons were killed and injured in the destructive Japanese quake, the one in Samoa was rated as just as strong a shock. The difference was that the former rocked a thickly populated area. Both were rated 7.25 on the seismologists' scale of magnitude.

Epicenter of the Jap quake was not on land, as had at first been suggested, but under Wakasa Bay, some 35 miles west of the ruined city of Fukui.

*Science News Letter*, July 10, 1948



# NE FIELDS

## CHEMISTRY

### Fuels from Nitrogen Find Many Industrial Uses

► NITROGEN from the air, which makes up four-fifths of what we take into our lungs at every breath, is a raw material from which fuels to supplement petroleum products will be made, particularly for special uses.

Certain nitrogen compounds, including ammonia and hydrazine, are actively being considered as fuels, the American Chemical Society was told at its meeting in Syracuse, N. Y., by L. F. Audrieth of the University of Illinois. The Germans, he said, experimented successfully with hydrazine to power submarines during the war. Concentrated ammonia, not the weak household solution, is already being used as fuel.

Nitrogen is one of the few inexhaustible raw materials since it is the major ingredient of the earth's atmosphere. This nitrogen is now being converted into useful chemicals by several processes. The most important of these is one by which the nitrogen is combined with hydrogen to form ammonia. From this ammonia many other nitrogen compounds can be made.

Among the newest of the basic nitrogen chemicals are hydrazine and hydroxylamine, both of which were largely laboratory curiosities ten years ago. Today, both are being produced in substantial quantities and new industrial uses are being found for them.

Hydrazine is a watery liquid which makes an excellent fuel because it burns with a hot flame and gives off no toxic gases. A chemist might call it a nitrogen analogue of the hydrogen peroxide long used for bleaching and other purposes. It is similar in chemical make-up but contains nitrogen instead of oxygen. Hydroxylamine stands between hydrogen peroxide and hydrazine, containing both nitrogen and oxygen.

Science News Letter, July 10, 1948

## ASTRONOMY

### Red Stars Grow Fat on Falling Dust Particles

► SMALL, red stars embedded in a dust cloud are growing fat on dust particles falling into them from the cloud, Dr. Otto Struve and Dr. Mogens Rudkjøbing of Yerkes and McDonald Observatories of the Universities of Chicago and Texas have discovered.

Very luminous blue and white stars in the dark nebula repel the dust by the outward pressure of their strong light, so that the particles cannot fall into their atmo-

spheres. But the small, relatively cool stars are bombarded by the bits of interstellar dust.

The dust particles seem to supply just the right amount of energy to give the spectra of these stars a number of peculiar bright lines. Dr. Struve characterized as "premature," however, any conclusion that all stars with these peculiar emission-lines are actually being born. He spoke at the joint meeting of the American Astronomical Society and the Astronomical Society of the Pacific at Pasadena, Calif.

Two years ago astronomers were thrilled by the announcement from Mount Wilson Observatory that Dr. A. H. Joy had observed some 40 stars with strong emission lines in their spectra. These stars were located in the vicinity of the great dust clouds in the constellation of Taurus, the bull. Dr. Joy suggested that the bright radiations of hydrogen, calcium and other gases might be connected with the presence of diffuse matter in the vicinity of these stars.

In extending this study, the McDonald astronomers obtained spectra of stars in the enormous opaque mass of cosmic dust located in the constellations of Ophiuchus, the serpent holder, and Scorpius, the scorpion, about half way between the bright stars Rho Ophiuchi and Sigma Scorpii. Stars in this region are mostly faint, and there are few of them. The dark cloud, about two million billion miles away, practically obliterates the light of the stars behind it.

The bright blue-white stars in the cloud were found to have no abnormalities in their spectra, indicating that they were not influenced by the nebulosity. Among the faint stars, a nest of them were found to have peculiar emission lines. Six such stars are close together, located in one of the densest regions of the dark cloud. One of these stars also varies in brightness, indicating that it is definitely associated with the dust cloud.

Science News Letter, July 10, 1948

## INVENTION

### "Preference Recorder" Registers Your Opinion

► HOW WOULD you like to be able to let the management know that its show is good, swell, punk, lousy, just by turning a button? A device to do just that has been invented, and U. S. patent 2,444,327 has been issued on it, to Alan W. Baldwin of New York.

It is a compact little box, with a dial and a hand-operated indicator that can be moved from neutral to plus one and plus two to indicate degrees of approval, or to minus one and minus two to register distaste. Inside, an electric mechanism writes a stepwise graph on a moving tape. This can be taken out and sent for analysis to radio or television headquarters—or even to the worried managers of a political convention.

Science News Letter, July 10, 1948

## RADIO

### Doctors Out Making Calls Are Paged by Radio

► PAGING doctors away from their offices will be the job of a special radio station to be erected in New York. Telanserphone, Inc., has now been granted a construction permit by the Federal Communications Commission to test the feasibility of the plan.

The station will provide only one-way transmission. It will serve the immediate New York area. Each doctor enrolled for the service will carry a small portable receiver. Each will be assigned an individual code number. This will be repeated on the air at intervals until the doctor reports to the station by telephone.

The theory behind the plan is that by it any individual doctor when out making calls may be located more easily than by the present procedure in which he is located by telephone, where frequently many calls must be made.

Science News Letter, July 10, 1948

## ARCHAEOLOGY

### Sinai Peninsula Inhabited Since Neandertal Times

► THE Sinai peninsula, through which the Children of Israel passed during their long wanderings in search of the Promised Land, served as a land bridge between Africa and Asia long before their time, new evidence discloses. Wendell Phillips, leader of the University of California African Expedition, tells in *Science* (June 25) of recent discoveries of stone implements showing that the region has been inhabited successively by Neandertal and Cro-Magnon men of the Old Stone Age, tribes of Neolithic or New Stone Age date, and a people of the transition period between the Neolithic and the beginning of the Age of Metals.

Egyptians were in Sinai from the earliest development of their civilization in the valley of the Nile, the expedition's archaeologists found. The great attraction for them was the turquoise mines of the region, which were worked by slave labor under Egyptian overseers.

Beginnings of the Semitic alphabet, which eventually developed into the beautiful characters of Hebrew script, date from these turquoise-mining days. Most of the letterings found on the rocks are fragments of tomb inscriptions, commemorating captive Semitic tribesmen who died under the harsh working conditions of the mines.

The expedition has also worked in Egypt, especially in the desert west of the Nile. Fossil remains of primitive whales and other aquatic animals found there show that this part of Africa was sea bottom in the pre-human millenia of the earlier Age of Mammals. Here also were found stone implements indicating long human occupation through the Old and New Stone ages.

Science News Letter, July 10, 1948

MEDICINE

# Regional Centers for Blood

**Blood products already have saved many lives. Patients in cities and hamlets will get its benefits soon when a nation-wide chain of blood centers is established.**

By JANE STAFFORD

► MR. X, aged 45, was sick, could not eat, could not work, would soon die if help could not be gotten for him. He was a victim of poisoning. The poison came from his teeth which were abscessed and in bad shape. They had been getting worse for years. Any ordinary man would have had the bad teeth drawn years ago and stopped the slow poisoning.

But Mr. X was not an ordinary man. He was a hemophiliac. This means that he had inherited through his mother the kind of blood that does not clot normally when shed. It was not much consolation to Mr. X to know that men and boys in some of the former royal families of Europe were cursed with the same blood condition.

## Dying of Poisoning

His dentist and his doctor knew that Mr. X was dying of poisoning. They knew the only way to save him was to get those bad teeth out, clean up the pockets of poisonous pus in his gums, and give him new teeth so he could eat real food that would give him back his strength. But they knew, too, that when he was a young fellow he had one tooth extracted and nearly bled to death afterwards.

Mr. X lives in a small town in western New York. Only 16,000 population, it is better off than many towns of its size. It has doctors, dentists, and a 150-bed hospital. But it is no medical center, where the latest scientific discoveries are available for treating the sick.

Yet there was a way to save Mr. X from his slow poisoning without risk of his bleeding to death. And because Mr. X lived within the Rochester Regional Blood Center area he was saved. Today he is up and about, has a set of new good teeth and "feels like a million dollars."

What saved his life were two products made from blood. One is called antihemophilic globulin. It comes from normal blood and aids in making hemophiliac blood clot temporarily. Mr. X was given

shots of this before his teeth were pulled. As a result, he did not bleed any more than an ordinary man would after having his teeth extracted. To make doubly sure Mr. X would not bleed too much, his gums were packed with fibrin foam. This is another product extracted from blood which makes blood clot as it oozes out of tiny blood vessels. Surgeons use it in many operations where bleeding is hard to control.

These two blood products did not cost Mr. X anything. He had of course to pay the doctor who gave him the products. But on his hospital bill were two lines that cost him no money, reading something like this:

Antihemophilic globulin from American Red Cross.

Fibrin foam for packing from American Red Cross.

The experience of Mr. X is almost unique today. Only in some of the large medical centers could it be duplicated very often. The blood products that saved his life are new and not in too abundant supply. But when the National Blood Program gets its projected nation-wide chain of blood centers established, Mr. X and others like him in big cities, small towns and on farms will receive its benefits.

## Rochester Center

The first of these centers was established in Rochester, N. Y., in January. From Rochester bloodmobiles go out into the towns and villages throughout the 12-county region on regularly scheduled days. In each place visited a donor station is set up, like the ones which during the war collected 13,326,242 pints of blood for our armed forces. From these donor stations the blood is taken back to Rochester for testing, typing, and preserving treatment. Then it is returned to the hospitals and doctors throughout the



**RED CROSS BLOODMOBILE**—Mobile units such as this one entering Hornell, N.Y., transport technical equipment and supplies to set up temporary centers in outlying communities to collect blood for the regional center where it will be turned over to the doctors and hospitals of the region after processing.





**CONVERTING BLOOD**—Whole blood is converted into plasma from which life-saving blood-products are made.

region as they need it. When the whole blood is too old for use in transfusions, it is returned to the center at Rochester. Here the red cells and plasma are separated. From the surplus plasma are made the products such as those which saved Mr. X.

The existence of these and other life-saving blood products is due primarily to researches by Dr. Edwin J. Cohn of Harvard. Dozens of different components of blood are now known to exist. Many of these have been extracted and put to medical use. Part of the Red Cross National Blood Program's purpose is to assist scientists in finding more uses for these by-products of the blood it will collect. The substances are by-products, since they are separated from plasma after the whole blood has become too old for use in transfusions. Separation of the products and packaging for medical use will be done by pharmaceutical houses. The Red Cross will pay for this, though the products will be supplied without charge.

Collection of whole red blood, 3,700,000 pints of it each year, is the main object of the National Blood Program. The 3,700,000-pint figure is the amount medical authorities estimate are needed each year for peacetime use in saving the sick and injured.

Benefitting already from the National Blood Program are countless patients in the Rochester region alone. There is six-

year-old Bobby of Elmira. Like Mr. X, Bobby has hemophilia. He has been coming to the hospital for years for blood transfusions. Every time he falls down and scrapes his knees he is likely to bleed so much that he needs a transfusion. During 1946 he had four blood transfusions. He has had two with blood from the Rochester center since its establishment in January this year.

#### Aids Hemophiliacs

Now his parents and doctor need not worry about whether there will be blood when he needs it. Nor do they need to worry about the cost of the blood. Even better, they have learned now about the antihemophilic globulin which helped Mr. X. This material will not cure hemophilia. But it can be given to Bobby off and on to see him through the period of losing his baby teeth, having his tonsils out if necessary, and protecting him against the injuries any active boy is liable to.

Serum albumin is helping another child in the Rochester region. This material proved a great boon when it became available during the war, because it could be used as a substitute for blood plasma. It had the great advantage of taking far less space in transit than plasma.

As the war drew to a close, medical scientists were discovering new uses for serum albumin besides that of substitut-

ing for plasma in transfusions. One such use is for treatment of a kidney disease called nephrosis. A five-year-old youngster in the small town of Hornell has nephrosis. His doctor knew serum albumin would help him to recover. But the material as prepared and sold commercially is very expensive. Enough for one treatment costs about \$80. And the child will need many such treatments.

The family could not meet this expense. The hospital managed to get enough for one treatment, but that was the limit of its resources. When the Rochester regional blood center was opened, the hospital sent word to the child's doctor and parents that it could now get more serum albumin, without charge. The five-year-old was brought back to the hospital and got the equivalent of \$300 worth of serum albumin. When he needs more, it will be available.

Children are not the only ones being helped. A 71-year-old man got four pints of blood to see him through an operation for removal of an eye. A young woman victim of Hodgkin's disease is getting continued transfusions of blood so that she can go on taking nitrogen mustard treatment for her illness.



#### Data from Four Furnaces Recorded by SPEEDOMAX In Lab at Notre Dame

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\*AIME, Metals Tech., Sept. 1947



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## Do You Know?

As much as 50 barrels of water may evaporate from the surface of the leaves of a large *elm tree* in a single hot summer day.

Corn-and-cob meal, made by grinding the corn and the cob together, has high value for *cattle feed*; the cob is found to be 64% as valuable as the grain itself for fattening purposes.

*Barite* is a mineral used as a weighing agent in heavy drilling oils, as a filler in rubber, a pigment in paints, a flux in glass melts, and in the manufacture of barium chemicals.

An old Indian belief that *beech trees* are never struck by lightning probably comes from the fact that wild beeches grow in groves with taller trees that are more apt to be struck.

Seismologists say that the *earth* shakes itself about 85 times a day; most of the shakes are little ones but not too small to be picked up by sensitive seismographs.

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A mechanical engineer comes in every week on his lunch hour for a transfusion. He has leukemia. The blood will not cure him, but it may help to keep him alive until a cure for this disease or an effective aid is discovered.

Three pints of whole blood before operation, and two pints immediately after and two pints daily for several more days were needed for another patient when his enormously enlarged spleen was removed. A 50-year-old woman suffered 12 years with ulcers from varicose veins on her legs. They are healing now, thanks to red blood cells sprayed on the

ulcers. The red cells were separated from whole blood returned to the Rochester center because it was too old for use in transfusion.

These are some of the special, unusual cases in which blood or its products are used. In the Rochester region, as elsewhere in the nation, come the ordinary emergency demands for blood to save an accident victim, a mother hemorrhaging unexpectedly in childbirth, a patient with a stomach ulcer that erodes a blood vessel and causes hemorrhage that could be fatal.

Second of three articles on blood.

Science News Letter, July 10, 1948

## PSYCHOLOGY

# Black Not Always Black

► BLACK is not always black, nor is white white.

If you have access to a projector for slides or color transparencies, you can prove this to yourself and your friends with a dramatic experiment. Just how it works is revealed by Dr. Hans Wallach of Swarthmore College, in the *Journal of Experimental Psychology* (June).

Cut a disk from black paper and hang it in the doorway of a room. Arrange your projector so that its light will be focussed on the disk and then will shine on the ceiling of the adjoining room out of sight of the "audience."

Now dim the light in the room. The disk, instead of being black, will appear white. But keep on shutting out all illumination until your room is completely dark, except for the illumination on the disk. Now that inky black disk will shine like a bright moon.

Suppose next you gradually cut down the light shining from the projector. What will happen? You may be surprised to find that it still looks luminous—not white or black—although as the light decreases, it becomes dimmer.

Whether an object looks white, black, gray, or luminous depends not only upon the illumination of the object and the light reflected from it, Dr. Wallach found, but upon the difference in light reflected by the object and its surroundings.

He tested this out and worked out the mathematics of the relations by using an ingenious combination of two projectors, one rigged up to project a disk of light on a white screen, the other fixed so that it would project a ring of light in such a way that it would form an outer edge for the disk.

When he kept the brightness of the disk the same and varied the brightness of the ring, he could at will change the appearance of the disk all the way from white to dark gray. The brighter the ring, the darker the disk would become. And when the ring

was made to look a dark gray, the disk then became white.

Cut out the ring altogether, and the disk ceases to look either white or gray and becomes a glowing moon.

In another experiment Dr. Wallach rigged up two sets of disks and rings, in which the area of the ring was the same as that of the disk. It was arranged so that in one set the ring was darker and in the other the disk was darker. The observer was allowed to vary the intensity of the second disk, and was requested to match the color of the two sets in this way.

It was found that when the colors matched to the observer's satisfaction, the proportion of brightness between disk and ring was just about the same in both sets, although one was much dimmer than the other. The small difference in ratio indicated that for the same intensity ratio, the object will appear a lighter gray if disk is brighter than the ring, than if the ring is brighter than the disk.

Science News Letter, July 10, 1948

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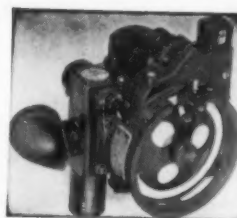


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## ENGINEERING

# Hope To Extract More Oil

► **MORE OIL** from so-called exhausted petroleum wells is hoped to result from research on the mixing of oil and water under high pressure, the American Chemical Society was told by Prof. Ernst A. Hauser and A. S. Michaels of the Massachusetts Institute of Technology.

Secondary production of oil from wells from which the free-flowing crude has been removed by pumping is always important but particularly so now with decreasing reserves and the increasing demands for petroleum products. Primary pumping takes from the oil-bearing sands about one-third of the crude they hold, it is estimated.

Another third can be recovered by various pressuring methods. In these, water, air, or natural gas taken from the oil are pumped down central wells to help the flow of the oil to the out-take wells. There are other methods also employed, but the amount still unrecovered is still too great.

The term underground oil pools, often used, is misleading. The crude underground is largely held in the pores of rocks and sand. The movement of the oil from locations away from the well to replace the crude which the pumps have removed is

slow. Pressure behind it helps, but there is still much held in or clinging to the tiny pores of the sandstone that repels the water used in pressurizing. A way is now sought to reduce this repulsion. This would make it possible to displace and recover more oil from either abandoned or existing wells.

In the study reported before the meeting, a new machine, called a high pressure tensiometer, is being used. It enables scien-

tists to measure the mixing of oil and water at pressures and temperatures as great as those encountered in deep oil wells.

The tensiometer is a heavy stainless steel box with thick glass windows which is filled with water in which a drop of oil is suspended from the tip of a thin metal rod. The temperature of the contents can be raised up to 350 degrees Fahrenheit while pressures up to 10,000 pounds per square inch are applied. The mutual repulsion of the two liquids is calculated from the shape of the oil drop, the changes of which are recorded with a microscopic camera.

Science News Letter, July 10, 1948

## Books of the Week

**TO SERVE YOU:** To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N. St., N. W., Washington 6, D. C. Ask for free publications direct from issuing organizations.

**CALCULATIONS OF QUANTITATIVE ANALYSIS**—Philip W. West—*Macmillan*, 162 p., \$2.75. A textbook on the mathematics of chemistry.

**CREATIVE CERAMICS: A Primitive Craft Becomes a Fine Art**—Katherine Morris Lester—*Manual Arts Press*, 213 p., illus., \$3.75. A most attractive hobby or art described in detail and illustrated with excellent photographs.

**GEM CUTTING**—J. Daniel Willems—*Manual Arts Press*, 224 p., \$3.50. Details of the art for both amateurs and professional gem

cutters. The author is himself a hobbyist.

**HOW FAMILIES USE THEIR INCOMES**—U. S. Dept. of Agriculture—*Govt. Printing Office*, 64 p., illus., paper, 30 cents. The story, largely in graphs, of where that dollar went.

**THE HUMAN BODY AND ITS FUNCTIONS: An Elementary Textbook of Physiology**—C. H. Best and N. B. Taylor—*Holt*, Rev. ed., 500 p., illus., \$3.60. This new edition of a well-known text has been rewritten to include recent outstanding discoveries in the field. The presentation is planned to be less elementary.

**JUNIOR ASTRONOMY CLUB'S GUIDE TO SUMMER OBSERVING**—Donald Hirsch, Ed.—*Junior Astronomy Club, Hayden Planetarium*, 34 p., illus., paper, 35 cents. Useful information and hints for all amateur astronomers.

**NEW WORLD OF SCIENCE**—R. Will Burnett, Bernard Jaffe, and Herbert S. Zim—*Silver Burdett*, 504 p., illus., \$2.80. A dramatically written and abundantly illustrated high-school textbook intended to help students to think critically and use scientific methods as well as to provide them with a store of useful scientific facts.

**POWER, MACHINES, AND PLENTY**—Gloria Waldron and J. Frederic Dewhurst—*Public Affairs Committee*, 32 p., illus., paper, 20 cents. A primer of economics based on a book "America's Needs and Resources" published by Twentieth Century Fund.

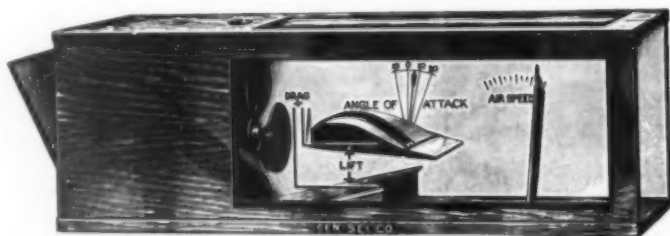
**SECOND SESSION OF THE GENERAL CONFERENCE OF THE UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION, Mexico City, November 6-December 3, 1947**—Report of U. S. Delegation With Selected Documents—*Govt. Printing Office*, 186 p., paper, 35 cents. Reporting the program of UNESCO.

**SURVEY OF UNIVERSITY PATENT POLICIES: Preliminary Report**—Archie M. Palmer—*National Research Council*, 170 p., \$1.50. Includes discussion of the relation of the patent policy to university research and the educational program.

**WINGS AROUND THE WORLD: The Story of American International Air Transport**—Burr W. Leyson—*Dutton*, 192 p., illus., \$3.00. Relating how our network of airlines was built up until now, according to the author, no point on earth is more than 60 hours distant by air transportation.

Science News Letter, July 10, 1948

## FLIGHT DEMONSTRATOR



The Congressional Aviation Policy Board state in their report: "An aeronautical educational program should be established throughout the public-school system in order that basic problems of the air age—the rudiments of flight—are well understood by future generations." This flight demonstrator will aid greatly in teaching the rudiments of flight.

It is excellent for classroom demonstrations of the principles of lift and drag in relation to angle of attack on an airplane wing. The effect of ailerons and flaps, the cause of a stall and other phenomena can be shown.

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## ENTOMOLOGY

**Glue Mosquitoes to Wires  
For Flight-Motions Study**

► EXPERIMENTERS with miniature model airplanes might well look to entomology for pointers in handling ultra-small flying machines of the most fragile kinds. For Prof. Marshall Laird, of Victoria University College, in Wellington, New Zealand, has succeeded in gluing live mosquitoes to the ends of slender brass wire mounts, without harm to the insects. (*Science*, June 18)

The technique was developed in the course of studies of mosquito wing motions during flight, with the objective of making the insects fly "in place" before the lens of an ultra-highspeed camera. They were first lightly anesthetized, then attached to the wires with a touch of quick-setting glue on the backs of their thoraces or chest regions.

When the desired photographs had been taken, the mosquitoes were released by sharp taps on the wires. Returned to their feeding cages, they lived nearly as long as control insects on which no experiments at all had been performed, thus demonstrating that the mounting method had not interfered with normal functioning.

Science News Letter, July 10, 1948

## MEDICINE

**Chemicals Check Bleeding  
In Many Body Disorders**

► SCORES of patients bleeding from leukemia or other disorders have had their bleeding stopped by doses of a dye, toluidine blue, or another chemical called protamine. For an exhibit demonstrating this discovery, Dr. J. Garrott Allen and associates of the University of Chicago received the American Medical Association Gold Medal at the association's meeting.

The chemicals do not cure leukemia, and they are not effective in hemophilia, hereditary bleeder's disease. They were discovered during search for means of combatting hemorrhage in irradiation damage, as from atom bombs. They stop the hemorrhage in irradiated dogs, but prolong life only slightly.

Science News Letter, July 10, 1948

**Save-the-Redwoods**

Send 10 cents each for these attractively illustrated pamphlets: "A Living Link in History," by John C. Merriam... "Trees, Shrubs and Flowers of the Redwood Region," by Willie L. Jepson... "The Story Told by a Fallen Redwood," by Emanuel Fritz... "Redwoods of the Past," by Ralph W. Chaney. All four pamphlets free to new members—send \$2 for annual membership (or \$10 for contributing membership).

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# 20th Century SPEECH AND VOICE CORRECTION

*Edited by* **EMIL FROESCHELS, M.D.**

**A**MONG the youngest branches of Science, ranks the physiology, pathology and therapy of speech and voice. The tremendous social importance of good speech and voice has urged scientists to contribute relatively more to this branch of science than to any other. Because of this, speech and voice therapy has developed to a remarkably high degree.

The editor has endeavored to point out the various aspects of speech and voice correction, and has chosen numerous collaborators well known in the field, to aid him in this task.

**CONTRIBUTORS INCLUDE:**

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# • New Machines and Gadgets •

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☼ **LIGHT ATTACHMENT** for telephones, recently patented, illuminates the dial on the ordinary desk-type instrument. It has a clamp to embrace the base portion above the recess, and holds a small electric bulb under a reflector over the dial.

Science News Letter, July 10, 1948

☼ **TABS FOR TEMPORARY** use in marking library cards are half-inch circular pieces, with tiny rectangular projections to extend above the cards when attached. Each disk has an adhesive on one side which, without moistening, holds the tab in place. Tabs stay on in the files and yet can be removed when desired by simply peeling off.

Science News Letter, July 10, 1948

☼ **MOTO-SANDER**, designed for use in the home and to operate on the ordinary household current, weighs 2.5 pounds, has a rubber-cushioned sanding pad 2.25 by 5.5 inches in size, and delivers 7,200 strokes a minute. It can finish tight corners in furniture and can be used for wax polishing.

Science News Letter, July 10, 1948

☼ **TINY HEARING AID** has a receiver so small that it can be recessed in the ear-mold and worn inside the ear opening. It uses a very small battery, and a printed



electrical circuit on a plastic wafer about the size of a card of paper matches, as shown in the picture.

Science News Letter, July 10, 1948

☼ **ELEVATOR LADDER**, adjustable in length and operated by electric or gasoline power, will carry 500-pound loads to a

maximum height of 40 feet. It has two aluminum ladder-like tracks that hold the four wheels of a loading platform. Upper ends of the tracks are curved over so that the load is delivered to the floor.

Science News Letter, July 10, 1948

☼ **RAYON CLOTHESLINE** coated with vinylite plastic is waterproof and easy to clean. It is claimed to have unusual strength and a very low stretch rate, and also to be easier to tie than most lines.

Science News Letter, July 10, 1948

☼ **RADIO TRANSMITTER-RECEIVER** for light planes weighs only nine pounds but provides tower communications, four course ranges, marker beams, standard broadcast frequencies, loop direction finding, six VHF transmitting channels and a cabin intercommunication system. A single switch shifts from one service to another.

Science News Letter, July 10, 1948

☼ **ELECTRIC KNIFE SHARPENER**, suitable for home or restaurant use, has an abrasive sharpening wheel, directly driven by a motor, and clips to hold the blade against guide plates which direct the edge of the knife against the abrasive wheel at the proper angle. The user draws the blade through the clips.

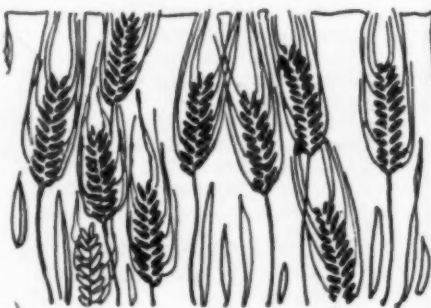
Science News Letter, July 10, 1948

## • Nature Ramblings by Frank Thone •

► **THE WORLD'S** first farmers cultivated the rich, easily-worked, high-yielding soils on the banks of rivers—the Nile, the Tigris-Euphrates, the Indus, the Yangtze. Their fields were flat, so that straight furrows were possible and eventually came to be considered the mark of agricultural skill and virtue. Erosion on the flatlands was no problem, so the advantages of clean cultivation could be exploited without offsetting loss of topsoil—which wouldn't have counted much in those deep alluvial lands, anyway. Main crops were the same species which the farmers' pre-agricultural ancestors had gathered as wild grains—barley and wheat towards the west, rice in the east.

So long as the world's civilized population was small and the river plains sufficed to keep it fed, no great trouble came. To be sure, town fought town in Mesopotamia over water rights and field boundaries, and the long, narrow ribbon that was Egypt sometimes broke into two or more pieces that went to war with each other. But these were fights of men against men, not attacks of men against the land itself.

### Force-of-Habit Farming



When the earth's greatly increased population made it necessary to clear upland forests and plow sloping lands, the foundations of our present worries were laid. Topsoil is much thinner on the hills, yet erosion is much faster, so that the "hastening ills" to which the land is prey come on at a cumulative rate. The evil is further accelerated when farmers defiantly plow

straight furrows up and down hill, inviting runoff water to cut runnels that finally coalesce into gullies of disaster.

Thus far, our only remedy has been to attempt a conversion of hillsides into more or less reasonable facsimiles of river-banks by contour plowing and terracing. On the limited flatlands thus created we keep on growing the same crops. Indeed, we pay the homage of high admiration to the Malays of southeastern Asia and the adjacent islands, who have transformed whole mountainsides into vast stairways of seasonal swamps in which they can grow rice.

Though we get a great deal of our food from hillside fields, we keep on planting the same riverside crops our prehistoric forebears first cultivated, perhaps as much as 10,000 years ago. It would seem more rational to try to find some high-yielding food plants that could be grown on sloping land without baring it to erosion by clean cultivation. That doesn't seem to be attracting much research effort as yet.

Science News Letter, July 10, 1948